



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/594,848

10/07/2008

Noriko Nagahori

850148.402USPC

3657

500 7590 11/15/2010  
SEED INTELLECTUAL PROPERTY LAW GROUP PLLC  
701 FIFTH AVE  
SUITE 5400  
SEATTLE, WA 98104

EXAMINER

XU, XIAOYUN

ART UNIT

PAPER NUMBER

1777

MAIL DATE

DELIVERY MODE

11/15/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,848	<b>Applicant(s)</b> NAGAHORI ET AL.	
	<b>Examiner</b> ROBERT XU	<b>Art Unit</b> 1777	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-3,5-12,14 and 17-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4,13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>08/06/2010</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's election without traverse of group I comprising claims 4, 13, 15 and 16 in the reply filed on 10/29/2010 is acknowledged. Claims 1-30 are pending in the application. Claims 1-3, 5-12, 14 and 17-30 are withdrawn from consideration. Claims 4, 13, 15 and 16 are considered on merits.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 does not define symbols: Y, W<sup>1</sup>, W<sup>2</sup>, W<sup>3</sup>, W<sup>4</sup>, Z<sup>1</sup>, Z<sup>2</sup>, Z<sup>3</sup>, Z<sup>4</sup>, Z<sup>5</sup> and Z<sup>6</sup> contained in the formula, which renders the claim unclear and indefinite. For examination purpose, Examiner interprets the symbols have the same definition as the symbols appeared in other claims.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

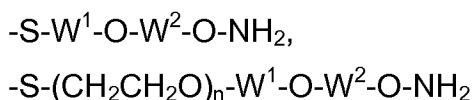
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 1777

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. **Claim 4 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 2005/0074551) (Huang) in view of Hutchens et al. (WO 98/59362) (Hutchens).

In regard to claims 4 and 13, Huang teaches a method for trapping a biological molecule specifically for analysis (see paragraph [0006]). The method comprises:

1) contacting a metal-organic residue complex with a biological molecule under conditions where the metal-organic residue complex and the biomolecule may react with each other. Huang teaches sulfhydryl (-SH) functional group that links the binding of the organic residue to gold and other metals (see paragraph [0064]). Huang teaches a sulfhydryl group for two of the preferred short chain ethylene glycol oligomers, EG2-SH and EG4-SH (see paragraph [0075]). Huang teaches that the organic residue may be functionalized with -NH<sub>2</sub> for binding to a biomolecule (see paragraph [0073]). Therefore, Huang teaches that the metal-organic residue complex contains a metal bound to a group by the following formula (see paragraph [0064], [0073], [0075], [0076]):



Wherein,

W<sup>1</sup> is ethylene,

W<sup>2</sup> is ethylene,

n is 2.

Huang also teaches 2) obtaining the metal-organic residue complex bound to the biomolecule (see paragraph [0083]).

Huang does not specifically teach that the biomolecule can be a sugar chain or a sugar chain-containing molecule. However, using metal-organic residue complex to trap a sugar chain or a sugar chain-containing molecule is known in the art. Hutchens teaches

Art Unit: 1777

metal-organic residue complex composed of sulfur (-S-) linking functionalized polyethylene glycol  $-(\text{CH}_2\text{CH}_2\text{O})_n$  to metal ion and using the metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties (see page 28, lines 4-6; page 39, lines 22-24, lines 29-31; page 41, lines 14-16, 18-20). Hutches teaches that the other end of the linker generally has an amino functionality ( $-\text{NH}_2$ ) (see page 27, line 31). At time of the invention it would have been obvious to one of ordinary skill in the art to use Hung's metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties as taught by Hutches, because glycoproteins with surface exposed hydrophilic sugar are biomolecules and react with Hung's metal-organic residue complex.

Hutches teaches 3) ionizing the metal-organic residue complex bound to the sugar chain of sugar chain-containing substance into sulfur atom-containing derivatives of the organic residue (see page 34, lines 32-33).

7. **Claim 15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchens in view of Lambert et al (US 4,511,658) (Lambert)

In regard to claims 15 and 16, Hutchens teaches metal-organic residue complex composed of sulfur linking organic reagent to metal ion and using the reagent of the metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties (see page 28, lines 4-6; page 39, lines 22-24, lines 29-31; page 41, lines 14-16, 18-20). Hutchens does not teach 4-amino-3-hydrazino-5-mercapto-1,2,4-triazole (AHMT) recited in the instant claims. However, AHMT is a well-known reagent for reacting with ketones and aldehydes. For example, Lambert has demonstrated the AHMT reacts with ketone (acetone) and aldehyde (formaldehyde) (see col. 3 to col. 4). Lambert further teaches that the concentration of formaldehyde can be detected in the range from 0.2 to 2 ppm (see col. 4, lines 9-11). It is well known that glucose is typical of the structure of monosaccharides. Hydroxyl groups ( $-\text{OH}$ ) are attached to all carbons except one. The carbon without an attached hydroxyl group is double-bonded to oxygen to form what is known as a carbonyl group. The location of this group determines whether or not a sugar is known as a ketone or an aldehyde sugar. If the group is not terminal then the sugar is known as a ketone. If the group is at

Art Unit: 1777

the end, it is known as an aldehyde. Therefore, at time of the invention it would have been obvious to one of ordinary skill in the art to use metal linked AHMT to detect sugar moieties containing ketone or aldehyde, because Lambert teaches that AHMT can detect aldehyde as low as 0.2 ppm.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT XU whose telephone number is (571)270-5560. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm, Fri 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

11/10/2010

/Yelena G. Gakh/  
Primary Examiner, Art Unit 1777

RX